

## Spin Dynamics and Ground State of the Frustrated Diamond Lattice Magnet CoAl<sub>2</sub>O<sub>4</sub> as seen by <sup>27</sup>Al NMR

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### Abstract

© 2016 Springer-Verlag Wien We report an experimental study of the low-temperature dynamics of electron spin fluctuations in the magnetically frustrated spinel CoAl<sub>2</sub>O<sub>4</sub> as revealed by <sup>27</sup>Al nuclear magnetic relaxation measurements in a magnetic field of 7.7 T in the temperature range  $4 < T < 240$  K. With this local probe technique, we show that the dynamics of the correlated Co spins strongly depends on the frustration of spin interactions and on Co/Al site disorder. The anisotropy of the temperature dependences of the spin-lattice ( $T_1^{-1}$ ) and spin-spin ( $T_2^{-1}$ ) <sup>27</sup>Al nuclear relaxation rates reveals a coexistence of the short-range Néel order below a characteristic temperature  $T^* = 8$  K and slow non-commensurate magnetic correlations below and above  $T^*$ , in agreement with the results of neutron diffraction experiments and our previous NMR spectroscopy data.

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